Work Order ID 112470 D3319-3 B112470 *112470* Page 1

February-13-14 1:09:02 PM

Item ID:	D3319-3			**Accept**	*N900040100*
Revision ID:					
Item Name:	Full-Length Wearplate				
Start Date:	30/01/2014	**Start Qty:**	~~20.00~~	*20*	**Cust Item ID:**
Required Date:	30/01/2014	**Req'd Qty:**	~~20.00~~	*20*	**Customer:**
Reference:					

split

8

Setup **Start** *NS1*

Stop *NS2*

Approvals: **Process Plan:** M **Date:** 14-02-13 **Tooling:** ______ **Date:** ______

QC: ______ **Date:** ______ **SPC (Y/N):** ______ **Date:** ______

Run **Start** *NR1*

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	**Revision Nbr**								
D3319	C								
100 *100* Waterjet FLOW CNC Waterjet	FLOW WATER JET **Memo** 1-Cut as per Dwg D3319 Dwg Rev: - Prog Rev: - ISSUE PO PO 23011 POSSIBLE SUPPLIER: LOEBSACK WATERJET	0.00 0.00				cmb	2/18/14		
105 *105* Packaging Packaging	Receive & Inspect for Damage & Mat'l Certs **Memo**	0.00 0.00				4/4/14 (20)			

DAS
27
9-09

QC6 ⟶ 4/4/14

20

DART AEROSPACE

DQA: ____________ Date: ____________

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: Date:

Work Order update only ☐

Work Order: ____________

Part No. ____________

NCR No. ____________

DISPOSITION

- Rework ☐
- Scrap ☐
- Use-as-is ☐
- Suspected Unapproved ☐

AGAINST DEPARTMENT/PROCESS

Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐
Machining ☐	Small Fab ☐	Prod. Eng. Coor. ☐	Quality ☐
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐
Large Fab ☐	Composite ☐	Supplier ☐	☐

Root Cause		Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	☐									
Doc/Data	☐									
Equip/Tooling	☐									
Handling/Pre	☐									
Material	☐									
Operator	☐									
Offset/Setup	☐									
Process	☐									
Supplier	☐									
Training	☐									
Transport	☐									
Unapproved	☐									

FAULT CATEGORY

Landing Gear

- ☐ Bending
- ☐ Centre Not Concentric
- ☐ Cracks
- ☐ Crimp/Kink/Ripple/Wave
- ☐ Cuffs
- ☐ Crushing
- ☐ Heat Treat
- ☐ Inspection Strip in Tube
- ☐ Marks/Chatter
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

General

- ☐ Bend
- ☐ BOM/Route
- ☐ Broken/Damage/Defect
- ☐ Burrs
- ☐ Contamination
- ☐ Countersink
- ☐ Cut Too Short
- ☐ Drawing
- ☐ Drill Holes
- ☐ Finish
- ☐ Fit/Function
- ☐ Folio/Program
- ☐ Grain
- ☐ Hardware
- ☐ Inspection Incomplete/Unqualified
- ☐ Instructions Incomplete/Unclear
- ☐ Misaligned/off center
- ☐ Mislabeled
- ☐ Misread
- ☐ Off-set
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
- ☐ Over/Under tolerance
- ☐ Part Incorrect
- ☐ Part Lost/Missing
- ☐ Part Moved
- ☐ Positioned Wrong
- ☐ Power Loss/Surge
- ☐ Pressure/Forced
- ☐ Set-up
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other ____________

____

____

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Work Order ID 112470 *112470*

February-13-14 1:09:02 PM

Item ID:	D3319-3	Accept	*N900040100*
Revision ID:		**Setup Start**	*NS1*
Item Name:	Full-Length Wearplate	**Stop**	*NS2*
Start Date:	30/01/2014	**Start Qty:** 20.00	*20*
Required Date:	30/01/2014	**Req'd Qty:** 20.00	*20*
Reference:			

Cust Item ID:

Customer:

Approvals: **Process Plan:** ______ **Date:** ______ **Tooling:** ______ **Date:** ______

QC: ______ **Date:** ______ **SPC (Y/N):** ______ **Date:** ______

Run Start *NR1*

Stop *NR2*

Sequence ID/ Work Center ID	**Operation Description**	**Set Up/ Run Hours**		**Tool ID**	**Tool #**	**Plan Code**	**Accept Qty**	**Reject Qty**	**Reject Number**	**Insp. Stamp**
115 *115* QC Quality Control	QC6- Inspect dimensions to drawing **Memo**	0.00 0.00	DAS 27 9-89 14/4/16				20			
125 *125* Small Fab Small Fab	**Memo** DEBURR A/R	0.00 0.00	DAS 27 9-89 14/4/22			n/k				
140 *140* Brake NC Brake NC	NC BRAKE **Memo** Form using DT8326 & DT8261 as per Dwg D3319Rev: C	0.00 0.00			DAS 30 9-89		20			14/04/22

DQA: ____________ Date: ____________

QA Closed: Date:

DART AEROSPACE

WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐

Work Order: ______________________

Part No. ______________________

NCR No. ______________________

DISPOSITION

- Rework ☐
- Scrap ☐
- Use-as-is ☐
- Suspected Unapproved ☐

AGAINST DEPARTMENT/PROCESS

- Skid-tube ☐
- Machining ☐
- Thermoforming ☐
- Large Fab ☐
- Crosstube ☐
- Small Fab ☐
- Finishing ☐
- Composite ☐
- Water Jet ☐
- Prod. Eng. Coor. ☐
- Rec/Store/Packaging ☐
- Supplier ☐
- Engineering ☐
- Quality ☐
- Other ☐

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design ☐									
Doc/Data ☐									
Equip/Tooling ☐									
Handling/Pre ☐									
Material ☐									
Operator ☐									
Offset/Setup ☐									
Process ☐									
Supplier ☐									
Training ☐									
Transport ☐									
Unapproved ☐									

FAULT CATEGORY

Landing Gear

- ☐ Bending
- ☐ Centre Not Concentric
- ☐ Cracks
- ☐ Crimp/Kink/Ripple/Wave
- ☐ Cuffs
- ☐ Crushing
- ☐ Heat Treat
- ☐ Inspection Strip in Tube
- ☐ Marks/Chatter
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

General

- ☐ Bend
- ☐ BOM/Route
- ☐ Broken/Damage/Defect
- ☐ Burrs
- ☐ Contamination
- ☐ Countersink
- ☐ Cut Too Short
- ☐ Drawing
- ☐ Drill Holes
- ☐ Finish
- ☐ Fit/Function
- ☐ Folio/Program
- ☐ Grain
- ☐ Hardware
- ☐ Inspection Incomplete/Unqualified
- ☐ Instructions Incomplete/Unclear
- ☐ Misaligned/off center
- ☐ Mislabeled
- ☐ Misread
- ☐ Off-set
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
- ☐ Over/Under tolerance
- ☐ Part Incorrect
- ☐ Part Lost/Missing
- ☐ Part Moved
- ☐ Positioned Wrong
- ☐ Power Loss/Surge
- ☐ Pressure/Forced
- ☐ Set-up
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other

____

____

____

Item ID: D3319-3 **Accept** *N900040100* **Setup** **Start** *NS1*
Revision ID: **Stop** *NS2*
Item Name: Full-Length Wearplate

Start Date: 30/01/2014 **Start Qty:** 20.00 *20* **Cust Item ID:**
Required Date: 30/01/2014 **Req'd Qty:** 20.00 *20* **Customer:**
Reference:

Approvals: **Process Plan:** ____ **Date:** ____ **Tooling:** ____ **Date:** ____ **Run** **Start** *NR1*
QC: ____ **Date:** ____ **SPC (Y/N):** ____ **Date:** ____ **Stop** *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150 *150* QC Quality Control	QC6- Inspect dimensions to drawing **Memo**	0.00 0.00 DAS 27 9-89 14/4/22				20			
160 *160* Large Fab Large Fab	Weld per dwg A/R Hardcoat steel Batch:____ Large Fab **Memo** Weld hard surface using D3319-3T2 per QSI 004 and Dwg D3319 Batch A/R 7560 Hardcoat Rod M128536	0.00 0.00				8		14-05-08	MAL
170 *170* QC Quality Control	QC10- Inspect visual per QSI004- ground welds **Memo**	0.00 0.00			DAS 9 9-89	14.05.08		(8)	

DQA: ____________ Date: ____________

QA Closed: Date:

WORK ORDER NON-CONFORMANCE / UPDATE

DART AEROSPACE

Work Order update only ☐

Work Order: ____________________

Part No. ____________________

NCR No. ____________________

DISPOSITION

- Rework ☐
- Scrap ☐
- Use-as-is ☐
- Suspected Unapproved ☐

AGAINST DEPARTMENT/PROCESS

- Skid-tube ☐
- Machining ☐
- Thermoforming ☐
- Large Fab ☐
- Crosstube ☐
- Small Fab ☐
- Finishing ☐
- Composite ☐
- Water Jet ☐
- Prod. Eng. Coor. ☐
- Rec/Store/Packaging ☐
- Supplier ☐
- Engineering ☐
- Quality ☐
- Other ☐
- ☐

Root Cause		Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	☐									
Doc/Data	☐									
Equip/Tooling	☐									
Handling/Pre	☐									
Material	☐									
Operator	☐									
Offset/Setup	☐									
Process	☐									
Supplier	☐									
Training	☐									
Transport	☐									
Unapproved	☐									

FAULT CATEGORY

Landing Gear

- ☐ Bending
- ☐ Centre Not Concentric
- ☐ Cracks
- ☐ Crimp/Kink/Ripple/Wave
- ☐ Cuffs
- ☐ Crushing
- ☐ Heat Treat
- ☐ Inspection Strip in Tube
- ☐ Marks/Chatter
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

General

- ☐ Bend
- ☐ BOM/Route
- ☐ Broken/Damage/Defect
- ☐ Burrs
- ☐ Contamination
- ☐ Countersink
- ☐ Cut Too Short
- ☐ Drawing
- ☐ Drill Holes
- ☐ Finish
- ☐ Fit/Function
- ☐ Folio/Program
- ☐ Grain
- ☐ Hardware
- ☐ Inspection Incomplete/Unqualified
- ☐ Instructions Incomplete/Unclear
- ☐ Misaligned/off center
- ☐ Mislabeled
- ☐ Misread
- ☐ Off-set
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
- ☐ Over/Under tolerance
- ☐ Part Incorrect
- ☐ Part Lost/Missing
- ☐ Part Moved
- ☐ Positioned Wrong
- ☐ Power Loss/Surge
- ☐ Pressure/Forced
- ☐ Set-up
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other ____________________

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Work Order ID 112470 *112470*

February-13-14 1:09:02 PM

Item ID: D3319-3 **Accept** *N900040100* **Setup** **Start** *NS1*

Revision ID: **Stop** *NS2*

Item Name: Full-Length Wearplate

Start Date: 30/01/2014 **Start Qty:** 20.00 *20* **Cust Item ID:**

Required Date: 30/01/2014 **Req'd Qty:** 20.00 *20* **Customer:**

Reference:

Run **Start** *NR1*

Stop *NR2*

Approvals: **Process Plan:** ________ **Date:** ________ **Tooling:** ________ **Date:** ________

QC: ________ **Date:** ________ **SPC (Y/N):** ________ **Date:** ________

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180 *180* QC Quality Control	QC5- Inspect part completeness to step on W/O	0.00 0.00				⑧	14.05.08		DAS 9 9-89
	Memo								
190 *190* Powdercoat Powder Coating	Grey Sandtex(Ref:4.3.5.6) per QSI005 4.3 MB878	0.00 0.00				8	Ø	14-5-9	DAS 34 9-89
	Memo START TIME: 9:05 OVEN TEMPERATURE: 320° FINISH TIME: 1035								
200 *200* QC Quality Control	QC3- Inspect Part Finish	0.00 0.00				8	Ø	Hl	14/05/09
	Memo								

DQA: ______ Date: ______

QA Closed: Date:

DART AEROSPACE

WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐

Work Order: ______

Part No. ______

NCR No. ______

DISPOSITION

Rework ☐
Scrap ☐
Use-as-is ☐
Suspected Unapproved ☐

AGAINST DEPARTMENT/PROCESS

Skid-tube ☐	Crosstube ☐	Water Jet ☐	Engineering ☐
Machining ☐	Small Fab ☐	Prod. Eng. Coor. ☐	Quality ☐
Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐
Large Fab ☐	Composite ☐	Supplier ☐	☐

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design ☐									
Doc/Data ☐									
Equip/Tooling ☐									
Handling/Pre ☐									
Material ☐									
Operator ☐									
Offset/Setup ☐									
Process ☐									
Supplier ☐									
Training ☐									
Transport ☐									
Unapproved ☐									

FAULT CATEGORY

Landing Gear

- ☐ Bending
- ☐ Centre Not Concentric
- ☐ Cracks
- ☐ Crimp/Kink/Ripple/Wave
- ☐ Cuffs
- ☐ Crushing
- ☐ Heat Treat
- ☐ Inspection Strip in Tube
- ☐ Marks/Chatter
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

General

- ☐ Bend
- ☐ BOM/Route
- ☐ Broken/Damage/Defect
- ☐ Burrs
- ☐ Contamination
- ☐ Countersink
- ☐ Cut Too Short
- ☐ Drawing
- ☐ Drill Holes
- ☐ Finish
- ☐ Fit/Function
- ☐ Folio/Program
- ☐ Grain
- ☐ Hardware
- ☐ Inspection Incomplete/Unqualified
- ☐ Instructions Incomplete/Unclear
- ☐ Misaligned/off center
- ☐ Mislabeled
- ☐ Misread
- ☐ Off-set
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
- ☐ Over/Under tolerance
- ☐ Part Incorrect
- ☐ Part Lost/Missing
- ☐ Part Moved
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- ☐ Power Loss/Surge
- ☐ Pressure/Forced
- ☐ Set-up
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other ______

H:/FORMS/Quality Assurance\approved QA/NCRWO-RevH

Work Order ID 112470
February-13-14 1:09:02 PM

112470

Item ID: D3319-3
Revision ID:
Item Name: Full-Length Wearplate
Start Date: 30/01/2014 **Start Qty:** 20.00 *20*
Required Date: 30/01/2014 **Req'd Qty:** 20.00 *20*
Reference:

Accept *N900040100*

Setup Start *NS1*
Stop *NS2*

Cust Item ID:
Customer:

Approvals: **Process Plan:** ______ **Date:** ______ **Tooling:** ______ **Date:** ______
QC: ______ **Date:** ______ **SPC (Y/N):** ______ **Date:** ______

Run Start *NR1*
Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210 *210* Packaging Packaging	Packaging	0.00				8X		14-5-13	DAS 26 9-89
	Memo Identify on inside surface using a permanent fine point marker with the following:TCCA-PDA, Dart Aerospace Ltd.P/N: D3319-3, B/N: BXXXXXFor Product Eligibility see PDA05-18 and Stock Location: ST 500	0.00							
220 *220* QC Quality Control	QC21- Final Inspection - Work Order Release	0.00				MLJ	14-05-13		
	Memo	0.00							

PPP 118928 4X
117492 4X

14-5-13

DQA: ____________ Date: ____________

QA Closed: Date:

WORK ORDER NON-CONFORMANCE / UPDATE

DART AEROSPACE

Work Order update only ☐

Work Order: ____________________

Part No. ____________________

NCR No. ____________________

DISPOSITION

- Rework ☐
- Scrap ☐
- Use-as-is ☐
- Suspected Unapproved ☐

AGAINST DEPARTMENT/PROCESS

- Skid-tube ☐
- Machining ☐
- Thermoforming ☐
- Large Fab ☐
- Crosstube ☐
- Small Fab ☐
- Finishing ☐
- Composite ☐
- Water Jet ☐
- Prod. Eng. Coor. ☐
- Rec/Store/Packaging ☐
- Supplier ☐
- Engineering ☐
- Quality ☐
- Other ☐
- ☐

Root Cause	Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design ☐									
Doc/Data ☐									
Equip/Tooling ☐									
Handling/Pre ☐									
Material ☐									
Operator ☐									
Offset/Setup ☐									
Process ☐									
Supplier ☐									
Training ☐									
Transport ☐									
Unapproved ☐									

FAULT CATEGORY

Landing Gear

- ☐ Bending
- ☐ Centre Not Concentric
- ☐ Cracks
- ☐ Crimp/Kink/Ripple/Wave
- ☐ Cuffs
- ☐ Crushing
- ☐ Heat Treat
- ☐ Inspection Strip in Tube
- ☐ Marks/Chatter
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

General

- ☐ Bend
- ☐ BOM/Route
- ☐ Broken/Damage/Defect
- ☐ Burrs
- ☐ Contamination
- ☐ Countersink
- ☐ Cut Too Short
- ☐ Drawing
- ☐ Drill Holes
- ☐ Finish
- ☐ Fit/Function
- ☐ Folio/Program
- ☐ Grain
- ☐ Hardware
- ☐ Inspection Incomplete/Unqualified
- ☐ Instructions Incomplete/Unclear
- ☐ Misaligned/off center
- ☐ Mislabeled
- ☐ Misread
- ☐ Off-set
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
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- ☐ Part Incorrect
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- ☐ Power Loss/Surge
- ☐ Pressure/Forced
- ☐ Set-up
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other ____________________

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Picklist Print

February-13-14 1:09:14 PM

Work Order ID: 112470 *112470*

Parent Item: D3319-3 *D3319-3*

Parent Item Name: Full-Length Wearplate

Start Date: 30/01/2014 **Required Date:** 30/01/2014

Start Qty: 20.00 **Required Qty:** 20.00

Comments: IPP: A05.05.12New issueKJ/JLM
IPP Rev:B Now on Waterjet 06-10-03 JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D3319-3P *D3319-3P* Full-Length Wearplate		Purchased	No				Each	0.0000	**	20	4/4/14		(20)

DQA: ____________ Date: ____________

QA Closed: Date:

WORK ORDER NON-CONFORMANCE / UPDATE

DART AEROSPACE

Work Order update only ☐

Work Order: ____________________

Part No. ____________________

NCR No. ____________________

DISPOSITION

- Rework ☐
- Scrap ☐
- Use-as-is ☐
- Suspected Unapproved ☐

AGAINST DEPARTMENT/PROCESS

- Skid-tube ☐
- Machining ☐
- Thermoforming ☐
- Large Fab ☐
- Crosstube ☐
- Small Fab ☐
- Finishing ☐
- Composite ☐
- Water Jet ☐
- Prod. Eng. Coor. ☐
- Rec/Store/Packaging ☐
- Supplier ☐
- Engineering ☐
- Quality ☐
- Other ☐
- ☐

Root Cause		Date	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	☐									
Doc/Data	☐									
Equip/Tooling	☐									
Handling/Pre	☐									
Material	☐									
Operator	☐									
Offset/Setup	☐									
Process	☐									
Supplier	☐									
Training	☐									
Transport	☐									
Unapproved	☐									

FAULT CATEGORY

Landing Gear

- ☐ Bending
- ☐ Centre Not Concentric
- ☐ Cracks
- ☐ Crimp/Kink/Ripple/Wave
- ☐ Cuffs
- ☐ Crushing
- ☐ Heat Treat
- ☐ Inspection Strip in Tube
- ☐ Marks/Chatter
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

General

- ☐ Bend
- ☐ BOM/Route
- ☐ Broken/Damage/Defect
- ☐ Burrs
- ☐ Contamination
- ☐ Countersink
- ☐ Cut Too Short
- ☐ Drawing
- ☐ Drill Holes
- ☐ Finish
- ☐ Fit/Function
- ☐ Folio/Program
- ☐ Grain
- ☐ Hardware
- ☐ Inspection Incomplete/Unqualified
- ☐ Instructions Incomplete/Unclear
- ☐ Misaligned/off center
- ☐ Mislabeled
- ☐ Misread
- ☐ Off-set
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
- ☐ Over/Under tolerance
- ☐ Part Incorrect
- ☐ Part Lost/Missing
- ☐ Part Moved
- ☐ Positioned Wrong
- ☐ Power Loss/Surge
- ☐ Pressure/Forced
- ☐ Set-up
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other ____________________

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DART AEROSPACE LTD		**Work Order:**	112470
Description: Wearplate		**Part Number:**	**D3319-3**
Inspection Dwg: D3319	**Rev:** C		**Page 1 of 1**

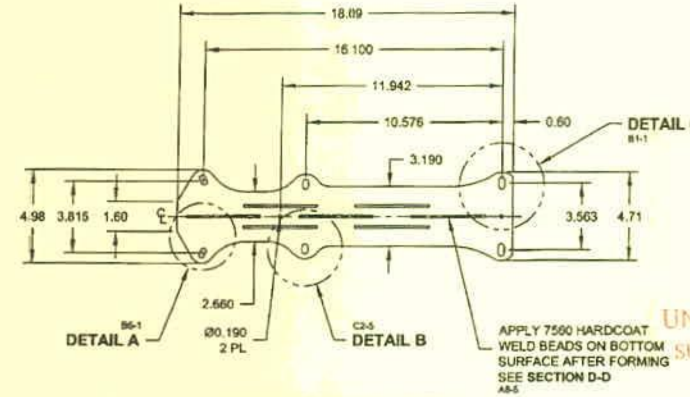
FIRST ARTICLE INSPECTION CHECKLIST

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Ø0.190	+0.005/-0.001	0.189	✓			
Ø0.500	+0.006/-0.001	0.500	✓			
0.316	+/-0.010	0.316	✓			
0.607	+/-0.010	0.607	✓			
2.94	+/-0.030	2.94	✓			
2.69	+/-0.030	2.70	✓			
3.527	+/-0.010	3.527	✓			
4.52	+/-0.030	4.52	✓			
5.063	+/-0.010	5.063	✓			
6.16	+/-0.030	6.16	✓			
0.60	+/-0.030	0.60	✓			
8.690	+/-0.010	8.690	✓			
30.790	+/-0.010	30.790	✓			
52.88	+/-0.030	52.88	✓			
62.770	+/-0.010	62.770	✓			
74.420	+/-0.010	74.420	✓			
75.52	+/-0.030	75.52	✓			
0.050	+/-0.010	0.049	✓			
		DAS				

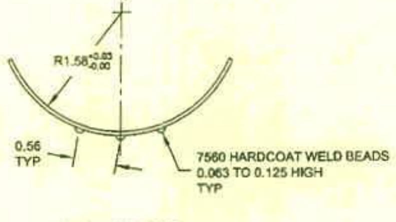
DAS
27
[illegible]

Measured by:	mm	**Audited by:**		**Preliminary Approval:**	
Date:	14/04/16	**Date:**	14/4/16	**Date:**	

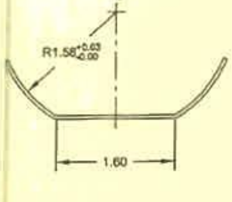
Rev	Date	Change	Revised by	Approved
A	07.07.18	New Issue	KJ/JLM	
B	12.05.15	Dimensions updated per Dwg Rev C	KJ	



D3319-1F FLAT PATTERN

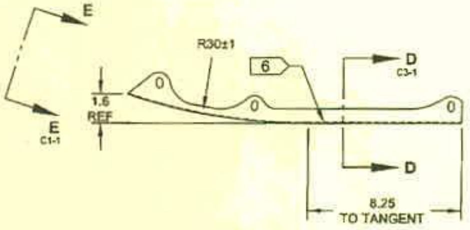


SECTION D-D B6-1
SCALE 4X

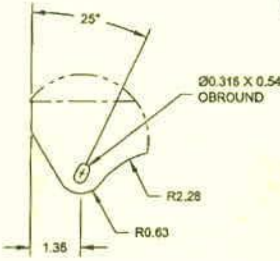


SECTION E-E B8-1
SCALE 4X

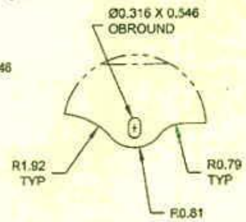
SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO 112470 MLJ
14-01-31



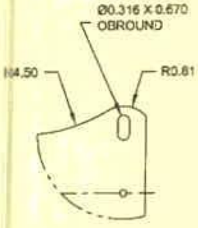
D3319-1 BENDING DETAIL
MAKE FROM D3319-1F



DETAIL A C8-1
SCALE 4X



DETAIL B C8-1
SCALE 4X



DETAIL C C8-1
SCALE 4X

D3319-1 WEARPLATE

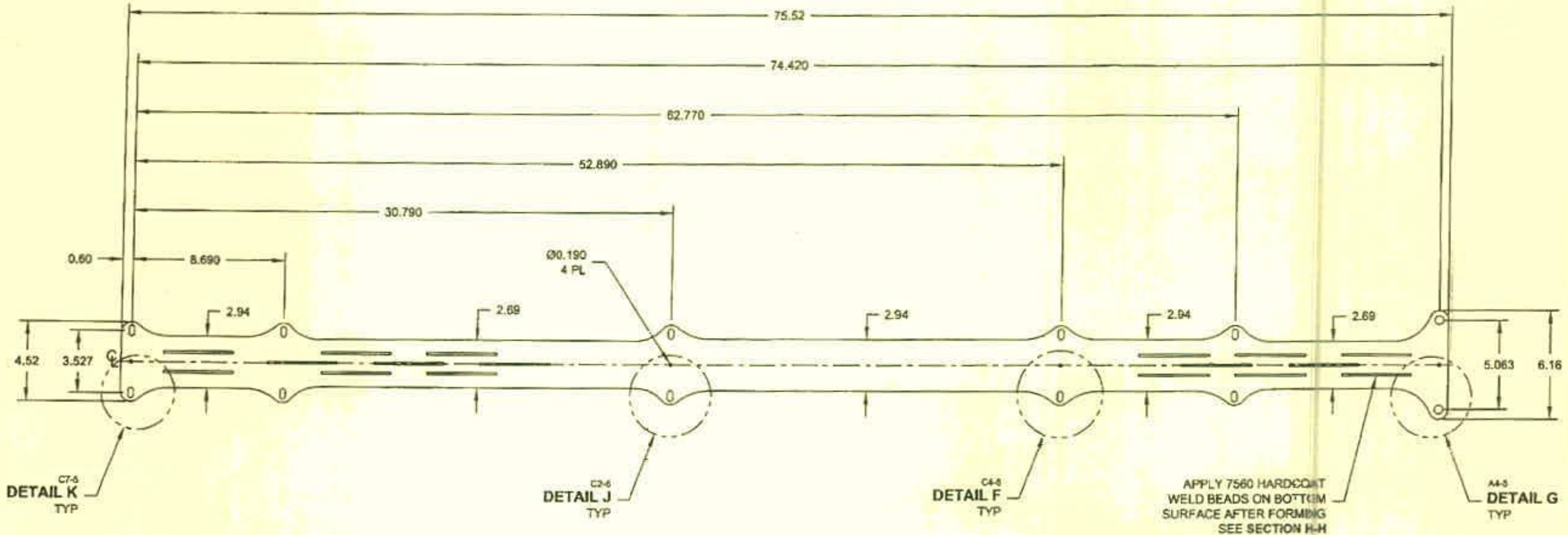
NOTES:

1) MATERIAL: AISI 1010-1025 OR ASTM A36/A366/A1008 OR CSA G40-21,
38W/44W/50W/60W/70W SERIES STEEL 18 GAUGE (0.048 THICK)
REF. DART SPEC. M1010-S18GA
2) FINISH: POWDER COAT GREY SANDTEX (REF.4,3.5.6) PER DART QSI 005 4.3
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: IDENTIFY ON INSIDE SURFACE WITH "TCCA-PDA, DART AEROSPACE LTD., P/N D3319-1 B/N BXXXXX,
FOR PRODUCT ELIGIBILITY SEE PDA05-18" PER DART QSI 044 6.1 (FINE POINT PAINT MARKER)
7) WEIGHT: 0.90 lbs APPROX
8) SYMMETRY: ABOUT CENTERLINE

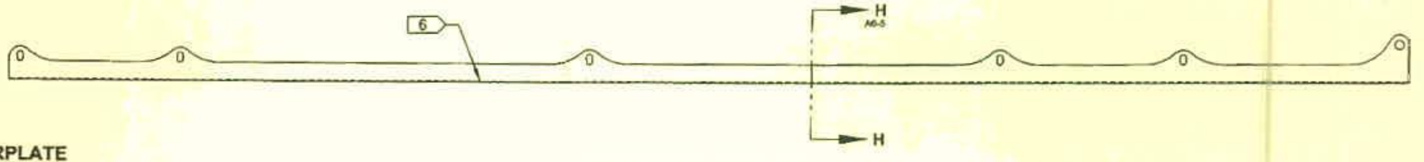
RELEASED
2012-03-16
PER ECN 12-546 12.03.16

REV.	DESCRIPTION	BY	DATE
C	UPDATE TO CURRENT STANDARDS IAW QSI 043; CLOSED AFT MOST HOLE ON -3/-5/-7 (REF DETAIL G). SEE NCR12-547.	MB	12.03.13
B	WIDEN HOLES, REDUCE WIDTH ON -3/-5/-7	PH	05.06.06
A	NEW ISSUE	PH	04.09.24

DESIGN	PH	**DART AEROSPACE LTD** HAWKESBURY, ONTARIO, CANADA	
DRAWN			
CHECKED		DRAWING NO.	REV. C
MFG. APPR.		D3319	SHEET 1 OF 4
APPROVED		TITLE	SCALE
DE APPR.		WEARPLATE	NTS
DATE	12.03.13	COPYRIGHT © 2004 BY DART AEROSPACE LTD	



D3319-3F FLAT PATTERN



D3319-3 BENDING DETAIL

MAKE FROM D3319-3F

D3319-3 WEARPLATE

NOTES;

1) MATERIAL: AISI 1010-1025 OR ASTM A36/A366/A1008 OR CSA G40-21,
38W/44W/50W/60W/70W SERIES STEEL 18 GAUGE (0.048 THICK)
REF. DART SPEC. M1010-S18GA
2) FINISH: POWDER COAT GREY SANDTEX (REF.4.3.5.6) PER DART QSI 005 4.3
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: IDENTIFY ON INSIDE SURFACE WITH "TCCA-PDA, DART AEROSPACE LTD., P/N D3319-3 B/N BXXXXX,
FOR PRODUCT ELIGIBILITY SEE PDA05-18" PE R DART QSI 044 6.1 (FINE POINT PAINT MARKER)
7) WEIGHT: 3.25 lbs APPROX
8) SYMMETRY: ABOUT CENTERLINE

RELEASED
2012 02 16
17.02.16

DESIGN	PH	**DART AEROSPACE LTD** HAWKESBURY, ONTARIO, CANADA
DRAWN		
CHECKED		DRAWING NO. REV. C
MFG. APPR.		D3319 SHEET 2 OF 4
APPROVED		TITLE SCALE
DE APPR.		WEARPLATE NTS
DATE	12.03.13	

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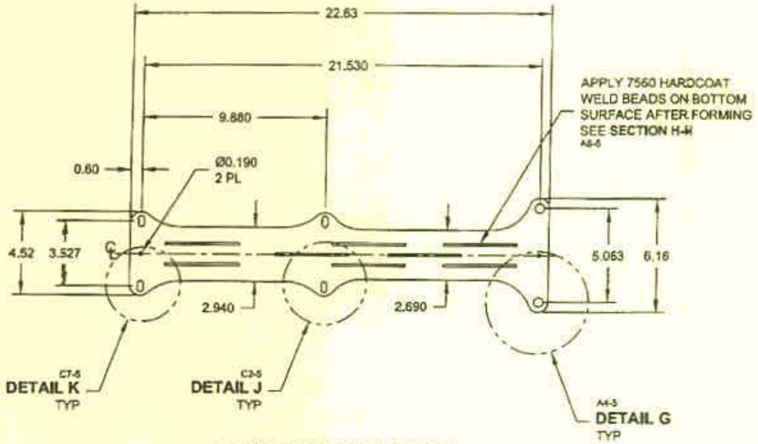
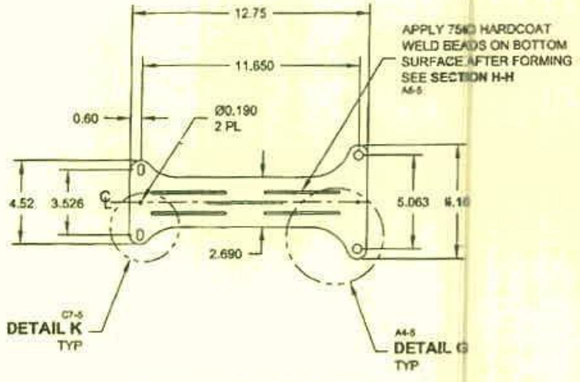
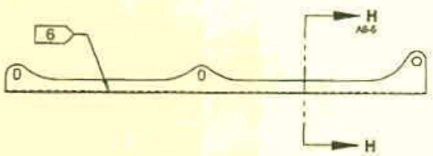


D3319-5F FLAT PATTERN

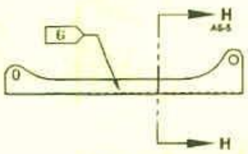


D3319-7F FLAT PATTERN



D3319-5 BENDING DETAIL

MAKE FROM D3319-5F



D3319-7 BENDING DETAIL

MAKE FROM D3319-7F

D3319-5/-7 WEARPLATE

NOTES:

1) MATERIAL: AISI 1010-1025 OR ASTM A36/A366/A1008 OR CSA G40-21,
38W/44W/50W/60W/70W SERIES STEEL 18 GAUGE (0.048 THICK)
REF. DART SPEC. M1010-S18GA
2) FINISH: POWDER COAT GREY SANDTEX (REF.4.3.5.6) PER DART QSI 005 4.3
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: IDENTIFY ON INSIDE SURFACE WITH "TCCA-PDA, DART AEROSPACE LTD., P/N D3319-X B/N BXXXXX,
FOR PRODUCT ELIGIBILITY SEE PDA05-18" PER DART QSI 046 6.1 (PERMANENT MARKER)
7) WEIGHT: D3319-5 = 1.05 lbs APPROX; D3319-7 = 0.60 lbs APPROX
8) SYMMETRY: ABOUT CENTERLINE

RELEASED
2012-02-16

DESIGN	PH	**DART AEROSPACE LTD** HAWKESBURY, ONTARIO, CANADA	
DRAWN		DRAWING NO.	REV. C
CHECKED		D3319	SHEET 3 OF 4
MFG. APPR.		TITLE	SCALE
APPROVED		WEARPLATE	NTS
DE APPR.			
DATE	12.03.13		

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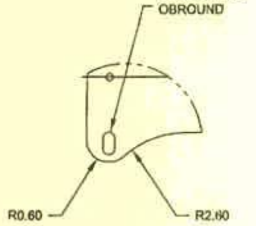
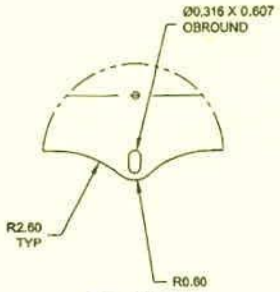
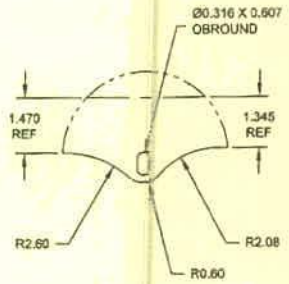


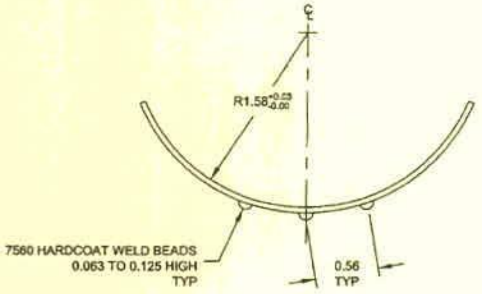
DETAIL K B8-2 C4-3 C8-3
SCALE 2X



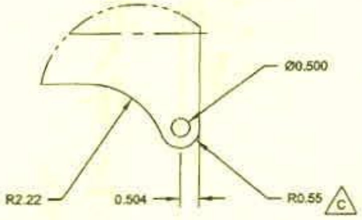
DETAIL F B3-2
SCALE 2X



DETAIL J B8-2 C7-3
SCALE 2X



SECTION H-H B4-2 B3-3 B6-3
SCALE 4X



B8-2 C2-3 C8-3 **DETAIL G** C
SCALE 2X

RELEASED
2012-02-16
CP 12.03.16

DESIGN	PH	**DART AEROSPACE LTD** HAWKESBURY, ONTARIO, CANADA	
DRAWN			
CHECKED		DRAWING NO.	REV. C
MFG. APPR.		3319	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		WEARPLATE	NTS
DATE	12.03.13		

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PURCHASE ORDER

Purchase Order ID **PO23011**

Purchase Order Date 2/14/2014
PO Print Date 2/14/2014

Order From : VC-LWC001
LOEBSACK WATERJET CANADA LTD.
55 NORTHFIELD DR. E.
P.O.BOX 339

WATERLOO, ONTARIO N2K 3T6

Ship To : DART AEROSPACE LTD
1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name		**Buyer**	Michael Gregoire
Vendor Phone		**Customer POID**	
		Customer Tax #	10127-2607
Ship To Contact		**Terms**	Net 30
Ship To Phone		**Currency**	CAD
Ship Via:	FedEx PI collect	**FOB**	FCA – (Free Carrier)
Ship Acct:			

Line Total: $751.20

5	D2804-1P	Bracket	3/28/2014 Yes 3/28/2014	12.00 Each	$62.60	$751.20

Manufacture as per drawing D2804 rev.c
B111518

Line Total: $751.20

6	D2803-1P	Bracket	3/28/2014 Yes 3/28/2014	12.00 Each	$91.85	$1,102.20

Manufacture as per drawing D2803 rev.B
B112380

Line Total: $1,102.20

7	D3319-3P	Full-Length Wearplate	3/28/2014 Yes 3/28/2014	20.00 Each	$19.25	$385.00

Manufacture as per drawing D3319 rev.c
B112470

PO Instructions: PROCUREMENT QUALITY CLAUSES
A005 RIGHT OF ENTRY
A008 FIRST ARTICLE INSPECTION (FAI) BY SELLER, (DOCUMENTATION SENT TO DART AEROSPACE)
A012 CHEMICAL AND PHYSICAL TEST REPORTS
A016 PERSONNEL QUALIFICATION
A017 RAW MATERIAL IDENTIFICATION (AS APPLICABLE)
A026 CERTIFICATION OF MATERIAL CONFORMANCE
A042 DART NOTIFICATION BY SUPPLIER

Note:

Loebsack WaterJET Canada Ltd.

55 Northfield Dr., E., Box 339
Waterloo, On. N2K 3T6
(519)570-6590
F. (519)893-4252

Certificate of Compliance

Sold To: DART Aerospace

Purchase Order Nu ID PO23011

Item	Quantity	Part Number	Revision	Description	Mtl. / Thk.	HT Number
18(4)	60	D3065-1	b	STEP SPACER	2024-T3 / 0.040"	663172A5
19(5)	100	D3065-3	b	STEP SPACER	2024-T3 / 0.040"	663172A5
21(7)	60	D3065-7	b	STEP SPACER	2024-T3 / 0.040"	663172A5
20(6)	110	D3065-5	b	STEP LEG	5052-H32 / 0.080"	3C5291
9(8)	20	D4093-1	d	BRACKET	6061-T6 / 0.750"	37797032
10(9)	10	D4093-3	d	BRACKET	6061-T6 / 0.750"	37797032
8(2)	20	D3319-1	c	WEARPLATE	CRS 18GA / 0.048	3683T3-51
7(1)	20	D3319-3	c	WEARPLATE	CRS 18GA / 0.048	3683T3-51
22(3)	120	D3537-1F	c	WEARPAD	304 SS / 0.063"	A1303988
11(10)	40	D3405-1F	b	GHW BRACKET	304 SS / 0.120"	350420

This is to certify that the whole of the supplies detailed hereon has been inspected, tested, packed, and unless otherwise stated, conform in all respects with the requirements of the contract or order.

Name: Derek Loebsack Title: President

Sign: Dated: 07-14-04

THYSSENKRUPP MATERIALS NA

J.M. WOODTURNING LTD
ALUMINUM PLATE 6061-T651
.750" THICK X 48.5000" X 96.5000"
PART NO.

PO/Rel FRED

We certify that this is a true copy of the report furnished by the producer of the metal, or data resulting from tests made in approved labs.

Signed by:____________________

Certificate of Mill Test Results

BL PEC-851084-001
19Nov13
Pg 1/1

MILL TEST REPORT

TA CHEN INTERNATIONAL, INC.

Customer: COPCON PO#:PEC-253613 SO#:PR6420
Item:.75048966061T651 Bundle:PFW871 Heat#:37797032

This MTR contains 1 page (Page# 1)
MTR#:HLCLR161784_PFW

TEST CERTIFICATE

HULAMIN

Hulamin Limited Reg. No. 1940/013[illegible]/06 VAT Reg. No. 4060149604
HEAD OFFICE: Moses Mabhida Rd, Pietermaritzburg 3201, P.O. Box 74, Pietermaritzburg 3200, South Africa
Telephone: +27 33 3956911 Telefax: +27 33 394 6335

Certificate No : 1209LB2662

BUYER:
TA CHEN INTERNATIONAL INC
5855 OBISPO AVE
LONG BEACH
CA 90805

Hulamin Load No:	HL012523
Lot No:	17/09/032C8
P/List No:	2/1161413
Release No:	RE098656
Cust Order No:	N03100-S
HULAMIN Order No:	1817428
Item Part:	1/1

Product : PLATE HEAT TREATED LINISHED, 6061-T651 0.75" x 48.5" x 96.5"

Dimension : 0.75" X 48.5" X 96.5"
Alloy - Temper : 6061 - T651

Certificate No : 1209LB2662
Cust Ref/Part No:
Combined P/List No : R'2484E

Case No : PFW871

MECHANICAL TEST RESULTS

Lot No.	Cast No.	Metal Id	Alloy	Spec No	Mechanical Properties							
					Yield Strength (Ksi)	UTS (Ksi)	Elongation A50 (%)	Earing (%)	TestDate	Gauge Length (Inches)	Bend Test	Actual Gauge (Inches)
Spec				Min Max	35.1	42.0	9					0.75 0.781
17/09/032C8	VAST	37797032	6061	1 2	41.6 41.6	46.7 46.7	15 15		07/09/12 07/09/12	2 2		0.765 0.765

CHEMICAL COMPOSITION

	Cast No.	Alloy	Si (%)	Fe (%)	Cu (%)	Mn (%)	Mg(%)	Cr(%)	Zn (%)	Ti (%)	Each(%)	Total(%)	Al(%)
Min			0.40		0.15		0.8	0.04					
Max			0.8	0.7	0.40	0.15	1.2	0.35	0.25	0.15	0.05	0.15	
	VAST	6061	0.69	0.44	0.28	0.11	1.01	0.21	0.01	0.012			97.20

CONFORMS TO: ASME SB-209 ASTM B209'10 AMS 4027N AMS-QQA-250/11, QQ.1997

For purposes of determining conformance with these specifications, an observed value or a calculated value shall be rounded "to the nearest unit" in the last right-hand digit used in expressing the specification limit, in accordance with the rounding method of ASTM Practice E29, for Using Significant Digits in Test Data to Determine Conformance with Specifications.

WE HEREBY CERTIFY, THAT THE MATERIAL DESCRIBED ABOVE HAS BEEN TESTED AND COMPLIES WITH THE TERMS OF THE ORDER CONTRACT. THE INSPECTION RESULTS INDICATED IN THE CHEMICAL COMPOSITION HAVE BEEN OBTAINED FROM CAST ANALYSIS.

Dr A. FooYon(HEAD OF CHEMICAL TESTING)

Ver1.0.1

V. Madram(HEAD OF PHYSICAL TESTING)

Printed Date: 15 Nov 2012

1 of 1

Doc No. 172071 Indexed 15Nov13 by

(1)

KAISER ALUMINUM
FABRICATED PRODUCTS

Best in Class

CERTIFIED TEST REPORT

http://Online.KaiserAluminum.com

Kaiser Aluminum
Trentwood Works
Spokane, WA 99215-5108
(800) 367-2586

CUSTOMER PO NUMBER: 5400197766-20	WORK PACKAGE:	CUSTOMER PART NUMBER: ALFLR01581	PRODUCT DESCRIPTION: HT Flat Sheet

KAISER ORDER NUMBER: 1160889	LINE ITEM: 2	SHIP DATE: 11/14/2013	ALLOY: 2024	CLAD: BARE	TEMPER: T3
WEIGHT SHIPPED: 3293 LB	QUANTITY: 117 PCS EST.	B/L NUMBER: 2044959	GAUGE: 0.0400 IN	WIDTH: 48.000 IN	LENGTH: 144.000 IN

SHIP TO:

COPPER & BRASS SALES
404 CENTURA COURT
SPARTANBURG, SC 29303 US

SOLD TO:

COPPER & BRASS SALES
ATTN: ACCOUNTS PAYABLE
P.O. Box 5116
SOUTHFIELD, MI 48086 US

MHU 1730227: LOT 663172A5: 117 pieces

Certified Specifications

AMS 4037/RevP AMS-QQ-A-250/4/RevA ASTM B 209/Rev10 CMMP 019/RevD CMMP 025/RevU

Test Code: 1504

Test Results:

LOT: 663172A5 CAST: 641 DROP: 27 INGOT: 3

Melted in USA
(ASTM E8/B557)
(EN 2002-1)

Tensile: Temper	Dir/#Tests	Ultimate KSI (MPA)	Yield KSI (MPA)	Elongation %
T3	LT / 02 (Min:Max)	68.1 : 68.2 (470 : 470)	46.0 : 46.1 (317 : 318)	17.1 : 17.8

(ASTM E1251)

Chemistry:	SI	FE	CU	MN	MG	CR	ZN	TI	V	ZR		OTHER
Actual	0.09	0.23	4.7	0.57	1.3	0.01	0.16	0.02	0.01	0.00	TOT	0.03

Chemistry:		SI	FE	CU	MN	MG	CR	ZN	TI	V	ZR		OTHER
2024	MIN	0.00	0.00	3.8	0.30	1.2	0.00	0.00	0.00	0.00	0.00	MAX	0.05
	MAX	0.50	0.50	4.9	0.9	1.8	0.10	0.25	0.15	0.05	0.05	TOT	0.15

Aluminum Remainder

Plant Serial: 4315340
Kaiser Order Number: 1160889
Line Item: 2

From: ThyssenKrupp Materials NA
Cust. THYSSENKRUPP MATERIALS NA - ECAD Del.: 2402984673
CstAr CstOr 256039
Wgt.: 55.296 LB Date 02/20/2014

KAISER ALUMINUM
FABRICATED PRODUCTS

Best in Class

CERTIFIED TEST REPORT

http://Online.KaiserAluminum.com

Kaiser Aluminum
Trentwood Works
Spokane, WA 99215-5108
(800) 367-2586

CERTIFICATION

Kaiser Aluminum Fabricated Products, LLC (Kaiser) hereby certifies that metal shipped under this order was melted in the United States of America or a qualifying country per DFARS 225.872-1(a), was manufactured in the United States of America, and meets the requirements of DFARS 252.225 for domestic content. This material has been inspected, tested and found in conformance with the requirements of the applicable specifications as indicated herein. For materialthicknesses outside specification limits, mechanical properties are as shown herein and chemical composition meets specification requirements. All metal which is solution heat treated complies with AMS 2772. Any warranty is limited to that shown on Kaiser's standard general terms and conditions of sale. Test reports are on file, subject to examination. Test reports shall not be reproduced except in full, without the written approval of Kaiser Aluminum Fabricated Products, LLC laboratory. The recording of false, fictitious or fraudulent statements or entries on the certificate may be punished as a felony underfederal law. ISO-9001:2000 certified.

JAMES HEMENWAY, LABORATORIES SUPERVISOR

Plant Serial: 4315340
Kaiser Order Number: 1160889
Line Item: 2

From: ThyssenKrupp Materials NA
Cust. THYSSENKRUPP MATERIALS NA - ECAD Del.: 2402984673
CstAr CstOr 8E6039
Wgt.: 55.296 LB Date 02/20/2014

John L. Zambotti

FORM: 1006 **WORKORDER:**

2402984673

COPPER AND BRASS SALES

MATERIAL TYPE

ALUMINIUM ALLOYS

PRODUCT DESIGNATION

2014 2024 2224 2324 7050 7075 7150 7175 7475 ALUMEC 89 ALUMEC 99 QC-7

"WARNING"

SMALL CHIPS,FINE TURNINGS AND DUST MAY IGNITE READILY.EXPLOSION POTENTIAL MAY BE PRESENT WHEN:DUST OR FINES ARE DISPERSED IN THE AIR; FINE, DUST OR MOLTEN ALUMINUM ARE IN CONTACT WITH CERTAIN METAL OXIDES; OR,CHIPS,FINES,DUST OR MOLTEN ALUMINUM ARE IN CONTACT WITH WATER OR MOISTURE.KEEP AWAY FROM IGNITION SOURCE.USE EXPLOSION-PROOF VENTILATION.KEEP MATERIAL DRY.

THIS PRODUCT CONTAINS BERYLLIUM AND COPPER.INHALING BERYLLIUM DUST OR FUMES MAY CAUSE CHRONIC BERYLLIUM DISEASE (CBD),A SERIOUS CHRONIC LUNGDISEASE IN SOME INDIVIDUALS.BERYLLIUM IS A CANCER HAZARD;OVER TIME CBDAND CANCER CAN BE FATAL,TARGET ORGAN IS PRIMARILY THE LUNG.INHALING LARGE AMOUNTS OF COPPER,MAGNESIUM OXIDE,MANGANESE OXIDE,ANDZINC OXIDE FUMES OR DUST MAY CAUSE METAL FUME FEVER WITH FLU-LIKE SYMPTOMS.CHRONIC OVEREXPOUSURE TO COPPER MAY CAUSE THICKENING OF THE SKIN;AND SKIN,TEETH,AND HAIR DISCOLORATION.CHRONIC OVEREXPOUSURE TOMANGANESE DUST CAN CAUSE CENTRAL NERVOUS SYSTEM DAMAGE,SCARRING OF THELUNGS AND REPRODUCTIVE HARM IN MALES.TARGET ORGAN IS PRIMARILY THE LUNG,BUT REPEATED HIGH EXPOSURE CAN ALSO AFFECT THE LIVER.CHRONICOVEREXPOSURE TO IRON OXIDE DUST/FUME MAY CAUSE LUNG SIDEROSIS. CHRONIC OVEREXPOSURE TO SILICON DUST CAN CAUSE CHRONIC BRONCHITIS.OVEREXPOSURE TO AMORPHOUS SILICA CAN CAUSE DRYING OF THE MUCOUSMEMBRANES OF THE EYES,NOSE,AND THROAT.

THIS PRODUCT ALSO CONTAINS NICKEL AND CHROMIUM COMPOUNDS.INHALATION OF NICKEL DUST OR FUME MAY RESULT IN INFLAMMATION OF THE RESPIRATORY TRACTAND CAUSE NASAL AND/OR LUNG CANCER.NICKEL HAS BEEN IDENTIFIED AS A POTENTIAL HUMAN CARCINOGEN.EXPOSURE TO CHROMIUM DUST OR FUMES MAY CAUSE METAL FUME FEVER WITH FLU-LIKE SYMPTOMS AND KIDNEY AND LIVER DAMAGE.UNDER HIGH TEMPERATURES,HEXAVALENT CHROMIUM MAY BE PRODUCED,IF IN THEINSOLUBLE FORM,IT IS A CONFIRMED HUMAN CARCINOGEN.(CALIFORNIA PROPOSITION 65).

IF COATED WITH OIL,MAY CAUSE SKIN IRRITATION/DERMATITIS BY CONTACT.WELDING FUME IS LISTED AS A POSSIBLE CARCINOGENIC TO HUMANS.
READ THE ALUMINIUM/ALUMINIUM ALLOYS MATERIAL SAFETY DATA SHEET (MSDS) ON FILE WITH YOUR EMPLOYER BEFORE WORKING WITH THIS MATERIAL.

*** If processing or recycling produces particulate,use exhaust ventilation or other controls designed to prevent exposure to workers. Examples of such activities include melting, welding,grinding,abrasive sawing,sanding and polishing.Any activity which abrades the surface of this material can generate airborne particulate.Use appropriate NIOSH approved respiratory protection (P95; P100 for lead with, quantitative fit testing required) if exposures exceed the permissible limits.**

*** The Occupational Safety and Health Administration (OSHA) have set mandatory limits on occupational exposures.**

*** Aluminum, in solid form and as contained in finished products presents no special health risk.**

*** Sold for manufacturing purposes only.This product can be recycled; contact your sales representative.**

For additional information, call or write to Copper and Brass Sales,22355 West Eleven Mile Road, Southfield, MI 48033,telephone248-233-5600, or visit our web site @ www.copperandbrass.com.

ALUMINUM LABEL NO. 300-1056 **ISSUED 10/01/2008**

1/2

ADITYA BIRLA **HINDALCO INDUSTRIES LIMITED**

Jeevan Deep Building, 1 Prafulla Chandra Sen Sarani,
Kolkata-700071, India, Tel:+91-33-22402210
Fax: +91-33-22884808
Regd. Office: Century Bhavan, Dr. Annie Besant Road, Worli,
Mumbai - 400 025, INDIA.

Page 1 of 2

Date 20-SEP-13

NAME OF THE PARTY	RYERSON CANADA INC.,161 THE WEST MALL,TORONTO, ONTARIO M9C4V8,,CANADA,,
PRODUCT	ALUMINIUM SHEET
QTY (MT)	20,923
LC/NO.& DATE	64687167 Dt. 20.08.2013
INVOICE NO	KRD/R/2014/72

COPY

THE TEST RESULTS OF THE SAMPLES DRAWN AND TESTED IN OUR LABORATORY ARE AS FOLLOWS :

QUALITY CERTIFICATE

SRNO	Package No	Alloy Temper	Net Wt (MT)	Size (mm)	Coil Nos.	Cast No./Heat No.
1	717380184	AA5052 , H32	1.487	3048 x 1219 x 2.29	H13RASH0805002	717380184
2	200192B0184	AA5052 , H32	1.508	3048 x 1524 x 2.54	H13RASH0819010	200192B0184
3	3C53084	AA5052 , H32	1.487	2438 x 1219 x 2.03	H13RASH0805017	3C53084
4	200192B0185	AA5052 , H32	1.503	3048 x 1524 x 2.54	H13RASH0819010	200192B0185
5	3C53087	AA5052 , H32	1.487	2438 x 1219 x 2.03	H13RASH0805017	3C53087
6	717380185	AA5052 , H32	1.511	3048 x 1219 x 2.29	H13RASH0805002	717380185
7	717290384	AA5052 , H32	1.488	3048 x 1219 x 2.29	H13RASH0805001	717290384
8	717290382	AA5052 , H32	1.485	3048 x 1219 x 2.29	H13RASH0805001	717290382
9	200193A0182	AA5052 , H32	1.47	3048 x 1524 x 2.54	H13RASH0819011	200193A0182
10	717380182	AA5052 , H32	1.487	3048 x 1219 x 2.29	H13RASH0805002	717380182

CHEMICAL COMPOSITION (%)

Cast No	Si	Fe	Mn	Mg	Cu	Zn	Cr	Ti	B	Zr	Ni	Pb	V	Sn	Bi	Others	Rem. Alum.
1 717380184	.011	.216	.006	2.345	.001	0	0	.006	0	0	0	.001	0	0	0		97.121
2 200192B0184	.133	.285	.041	2.413	.01	0	0	.02	0	0	0	.005	0	0	0		96.887
3 3C53084	.2	.49	.137	2.6	.009	0	0	.013	0	0	0	0	0	0	0		96.397
4 200192B0185	.133	.285	.041	2.413	.01	0	0	.02	0	0	0	.005	0	0	0		96.887
5 3C53087	.2	.49	.137	2.6	.009	0	0	.013	0	0	0	0	0	0	0		96.397
6 717380185	.081	.216	.006	2.345	.001	0	0	.006	0	0	0	.001	0	0	0		97.121
7 717290384	.105	.262	.003	2.528	.001	0	0	.006	0	0	0	.001	0	0	0		96.873
8 717290382	.105	.262	.003	2.528	.001	0	0	.006	0	0	0	.001	0	0	0		96.873
9 200193A0182	.124	.301	.056	2.367	.016	0	0	.02	0	0	0	.005	0	0	0		96.85
10 717380182	.081	.216	.006	2.345	.001	0	0	.006	0	0	0	.001	0	0	0		97.122

MECHANICAL PROPERTIES

OTHER TESTS

Cast No	UTS(Kg/mm2)	YS (Kg/mm2)	% Elongation	Bend Test		
1 717380184	24.5	0	11.2	0 T Satisfactory		
2 200192B0184	23.2	0	10.6	0 T Satisfactory		
3 3C53084	22.9	0	9.5	0 T Satisfactory		
4 200192B0185	23.2	0	10.6	0 T Satisfactory		
5 3C53087	22.9	0	9.5	0 T Satisfactory		
6 717380185	24.5	0	11.2	0 T Satisfactory		
7 717290384	23.4	0	10.6	0 T Satisfactory		
8 717290382	23.4	0	10.4	0 T Satisfactory		
9 200193A0182	22.6	0	11.8	0 T Satisfactory		
10 717380182	24.5	0	11.2	0 T Satisfactory		

Remarks:- (1) RYERSON PO NO.735570 (2) ISSUED BY THE MANUFACTURER.

FOR HINDALCO INDUSTRIES LIMITED

AUTHORISED SIGNATORY

2/2

ADITYA BIRLA HINDALCO INDUSTRIES LIMITED

HINDALCO

Jeevan Deep Building, 1 Prafulla Chandra Sen Sarani,
Kolkata-700071, India. Tel:+91-33-22402210
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Regd. Office: Century Bhavan, Dr. Annie Besant Road, Worli,
Mumbai - 400 025, INDIA.

Page 2 of 2

Date- 20-SEP-13

NAME OF THE PARTY	: RYERSON CANADA INC., 161 THE WEST MALL, TORONTO, ONTARIO M9C4V8, CANADA.,
PRODUCT	ALUMINIUM SHEET.
QTY (MT)	20.923
LC/PO. & DATE	64687167 Dt. 20.08.2013
INVOICE NO	HRB/R/2014/72

COPY

QUALITY CERTIFICATE

SRNO	Package No	Alloy Temper	Net Wt (MT)	Size (cm)	Coil Nos.	Cast No./Heat No.
11	3C53086	AA5052 , H32	1.486	2438 x 1219 x 2.03	H13HASH0805017	3C53086
12	3C52981	AA5052 , H32	1.517	2438 x 1219 x 2.03	H13HASH0805018	3C52981
13	2D0192B0182	AA5052 , H32	1.502	3048 x 1524 x 2.54	H13HASH0819010	2D0192B0182
14	2D0193A0185	AA5052 , H32	1.505	3048 x 1524 x 2.54	H13HASH0819011	2D0193A0185
		Total-	20.923			

CHEMICAL COMPOSITION (%)

	Cast No	Si	Fe	Mn	Mg	Cu	Zn	Cr	Ti	B	Zr	Ni	Pb	V	Sn	Bi	Others	Rem. Alum.
11	3C53086	.1	.48	.137	2.6	.009	0	0	.013	0	0	0	0	0	0	0		96.397
12	3C52981	.2	.45	.137	2.6	.009	0	0	.013	0	0	0	0	0	0	0		96.397
13	2D0192B0182	.133	.285	.041	2.413	.01	0	0	.02	0	0	0	.005	0	0	0		96.897
14	2D0193A0185	.124	.301	.056	2.367	.016	0	0	.03	0	0	0	.016	0	0	0		96.83

MECHANICAL PROPERTIES

OTHER TESTS

	Cast No	UTS(Kg/mm2)	PS (Kg/mm2)	% Elongation	Bend Test		
11	3C53086	22.9	0	9.3	0 T Satisfactory		
12	3C52981	22.4	0	10	0 T Satisfactory		
13	2D0192B0182	23.2	0	10.6	0 T Satisfactory		
14	2D0193A0185	22.6	0	11.8	0 T Satisfactory		

Remarks:- (1) RYERSON PO NO.736670 (2) ISSUED BY THE MANUFACTURER.

For HINDALCO INDUSTRIES LIMITED

AUTHORISED SIGNATORY

ESSAR STEEL

ESSAR STEEL ALGOMA INC.,105 West Street, Sault Ste. Marie,Ontario, Canada P6A 7B4

SO No.,Item & Date.: 8017177 000020 2014/01/09	Shipment No.& Date.: 1000083594 2014/01/10	TC No., Date & Time :	ESA-128192 2014/01/12 - 08:41:14
Sold to Customer Name and Address :	Ship to Customer Name and Address:	Customer PO NO./Item:	744335 / 2
RYERSON INC	RYERSON INC	BOL NO.:	1000083594
FINANCIAL DRIVE 7525	FINANCIAL DRIVE 7525	Cust.Part No.:	7804-2405
BRAMPTON,Ontario,Canada	BRAMPTON,Ontario,Canada	Carrier :	NATIONAL TRANSPORTATION - 1158A
L6Y 5P4	L6Y 5P4		

Customer Specification : CR STEEL SHEET Carbon CQ / CS ASTM A1008 CS TY B (2012) Mark Number 7804-2405 Batch Annealed Top Semi Critical Surface Improved Shape Pickled Light Oiled Light Matte Finish Edge Sealant Required Std Thickness Tol

Cust Use : AUTO IMPROVED SHAPE &SURF

Supplementary Instructions : Test Cert 1:905-792-1617

Insp T/R : Chemical Analysis

ESSAR STEEL ALGOMA INC. HEREBY CERTIFIES THAT THE MATERIAL HEREIN DESCRIBED WAS MADE AND TESTED IN ACCORDANCE WITH THE RULES OF THE SPECIFICATION SHOWN. ALL RESULTS ARE RETAINED IN ACCORDANCE WITH THE COMPANY'S STANDARD RECORD KEEPING PRACTICES.

THIS MILL TEST REPORT MAY NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF ESSAR STEEL ALGOMA INC. IF YOU RECEIVE THIS DOCUMENT AND ARE NOT THE INTENDED RECEIVER, PLEASE CALL (705)945-4096 FOR INSTRUCTIONS ON METHOD OF DISPOSAL OF DOCUMENT.

MEETS EN 10204 3.1

ISO QUALITY AND ENVIRONMENTAL CERTIFICATES AVAILABLE AT WWW.ESSARSTEELALGOMA.COM

ALL HEATS FULLY KILLED.

HEATS INDICATED WITH (*) FINE GRAINED.

HEATS INDICATED WITH (+) MADE IN CANADA WITH DOMESTIC AND NORTH AMERICAN MATERIALS.

Dimensions (T x W x L)	Batch No.	Heat No-MS	Quantity	Pcs
0.0440 " x 48.000 "	SAM9918B	3683T3-51	21,740 LB	1

CHEMICAL PROPERTIES

Heat No. (wt%)	C	Mn	P	S	Si	Cr	Ni	Cu	Mo	Al	Nb	V	B	Ti	N
3683T3*+	0.04	0.26	0.003	0.007	0.020	0.01	0.01	0.01	0.00	0.035	0.000	0.000	0.0000	0.001	0.0033

K. UGHADPAGA

MANAGER METALLURGICAL SERVICES

WARNING THE TEST RESULTS AND VALUES REPORTED HEREIN INDICATE ONLY THAT (1) THE PARTICULAR STEEL FOR WHICH THIS CERTIFICATE IS ISSUED MEETS THE MINIMUM SPECIFIED YIELD STRENGTH AND (2) THE ANALYSIS AND PHYSICAL PROPERTIES OF SUCH STEEL ARE IN CONFORMANCE WITH THE REQUIREMENTS OF THE SPECIFICATION INDICATED. THE RESULTS OR VALUES REPORTED HEREIN CAN NOT BE USED TO QUALIFY THE STEEL FOR ANY SPECIFICATION OTHER THAN THE ONE INDICATED AND CAN NOT BE RELIED UPON FOR ANY PURPOSE (INCLUDING DESIGN OR CALCULATIONS) AS REPRESENTING THE ACTUAL STRENGTH OF SUCH STEEL.

Date:2014/01/12 Time:08:41:14 Page no:1 of 1

14	13102614	0.7620	1219.2	2438.4	88	1644	271	665	58	89.5	A1303883	0.0400	0.390	1.1300	0.0350	[illegible]	8.0200	18.120	0.0400
15	13102615	0.7620	1219.2	2438.4	87	1626	271	665	58	89.5	A1303883	0.0400	0.390	1.1300	0.0350	[illegible]	8.0200	18.120	0.0400
16	13102616	1.2192	1219.2	2438.4	54	1494	267	695	55	87	A1303987	0.0400	0.550	1.1000	0.0330	0.0010	8.0200	18.160	0.0400
17	13102617	1.2192	1219.2	2438.4	50	1378	267	695	55	87	A1303987	0.0400	0.550	1.1000	0.0330	0.0010	8.0200	18.160	0.0400
18	13102618	1.2192	1219.2	3048	42	1460	267	695	55	87	A1303987	0.0400	0.550	1.1000	0.0330	0.0010	8.0200	18.160	0.0400
19	13102619	1.2192	1219.2	3048	45	1574	267	695	55	87	A1303987	0.0400	0.550	1.1000	0.0330	[illegible]	8.0200	18.160	0.0400
20	13102620	1.5240	1219.2	2438.4	43	1485	271	680	52	87	A1303988	0.0400	0.430	1.1300	0.0380	[illegible]	8.0300	18.230	0.0300
21	13102621	1.5240	1219.2	2438.4	43	1487	271	680	52	87	A1303988	0.0400	0.430	1.1300	0.0380	[illegible]	8.0300	18.230	0.0300
22	13102622	1.9050	1219.2	2438.4	40	1725	268	650	55	84	A2304006	0.0300	0.440	1.1500	0.0380	0.0010	8.1000	18.250	0.0400
23	13102623	1.9050	1219.2	2438.4	41	1755	268	650	55	84	A2304006	0.0300	0.440	1.1500	0.0380	0.0010	8.1000	18.250	0.0400
24	13102624	3.0480	1219.2	3048	17	1482	280	675	54	84	A1303883	0.0400	0.390	1.1300	0.0350	0.0010	8.0200	18.120	0.0400
25	13102625	3.0480	1219.2	3048	19	1656	280	675	54	84	A1303883	0.0400	0.390	1.1300	0.0350	[illegible]	8.0200	18.120	0.0400

备注（Remarks）：

1. 尺寸和表面：合格

Size and Surface : Guaranteed

兹证明所列产品均符合订单和标准的制造要求

WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE IN ACCORDANCE WITH THE ORDER AND SPECIFICATION

*此报告仅可完全复制

*The report can only be copied completely

技术本部

TECHNICAL DEPT.

无锡宝昌金属制品有限公司

We hereby certify that the material herein
described by the specification [illegible]

[illegible] CERTIFICATE

STAINLESS STEEL SHEETS,
[illegible] PLATES

[illegible]

THYSSENKRUPP MATERIALS NA

Certificate of Mill Test Results

BL PEC-000000-000

PO/Rel

We certify that this is a true copy of the report furnished by the producer of the metal, or data resulting from tests made in approved labs.

Signed by: ____

Pg 1/1

Attn: RICK

PART NO.

1846

ThyssenKrupp

ThyssenKrupp Stainless USA

INSPECTION CERTIFICATE

CERTIFICADO DE INSPECCION

ABNAHMEPRÜFZEUGNIS

according to / de acuerdo con / nach

EN 10204-3.1

0000032224 / 12/12/2012

1 / 1

1 ThyssenKrupp Drive; P.O. Box 13000; Calvert, AL 36513-1300

OLBERT METALS SALES LIMITED
980 DERRY ROAD EAST SUITE 306
MISSISSAUGA ON L5T 2J8
CANADA

[illegible]	OLBERT METALS SALES LIMITED,MISSISSAUGA
[illegible]	TO-1846
[illegible]	001147789 / 001
[illegible]	85328221 / 010
[illegible]	SHEET/HOJAS/BLECH
[illegible]	TYPE 304L/304
[illegible]	ASTM A240/A240M, ASME SA-240 Sec.II Part A Ed.2010 ASTM A480/A480M, ASME SA-480 Sec.II Part A Ed.2010
[illegible]	3.05 mm x 1,219.20 mm x 2,438.40 mm 0.1200 inch x 48.0000 inch x 96.0000 inch
[illegible]	AOD
[illegible]	[illegible] / 2B

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6057916	32	4,890 lb / 2,218 kg	713000	350420	1000068830	1000068832
6061017	32	4,886 lb / 2,216 kg	718000	350420	1000068830	1000068832
[illegible]	64	9,776 lb / 4,434 kg				

[illegible]	[illegible]	% C	% Si	% Mn	% P	% S	% Cr	% Ni	% N			
350420	USA	0.026	0.30	1.66	0.027	0.0018	18.05	8.00	0.080			

[illegible]	TRANSVERSE

[illegible]	YS0.2% PSI / MPa	TS PSI / MPa	EL A2" %	HRB		
1000068830	43,800 / 302	93,111 / 642	56.9	82		
1000068832	43,945 / 303	93,111 / 642	56.1	82		

[illegible] OK

[illegible] OK

No weld repairs

No intentional additions of Mercury compounds were made or used

Free of radioactive contamination

EU RoHS Directive 2002/95/EC Compliant

Country of Heat as per ISO 3166-1

ThyssenKrupp Stainless USA, LLC

An ISO 9001:2008 certified company

Andrew Faucett
Phone: +1 251 829 3422

12/12/2012